

HYDRON BLUE

PATENTED



CASSELLA COLOR COMPANY

182 and 184 Front Street,
NEW YORK.

Boston: 39 Oliver Street.

Philadelphia: 126 and 128 South Front Street.

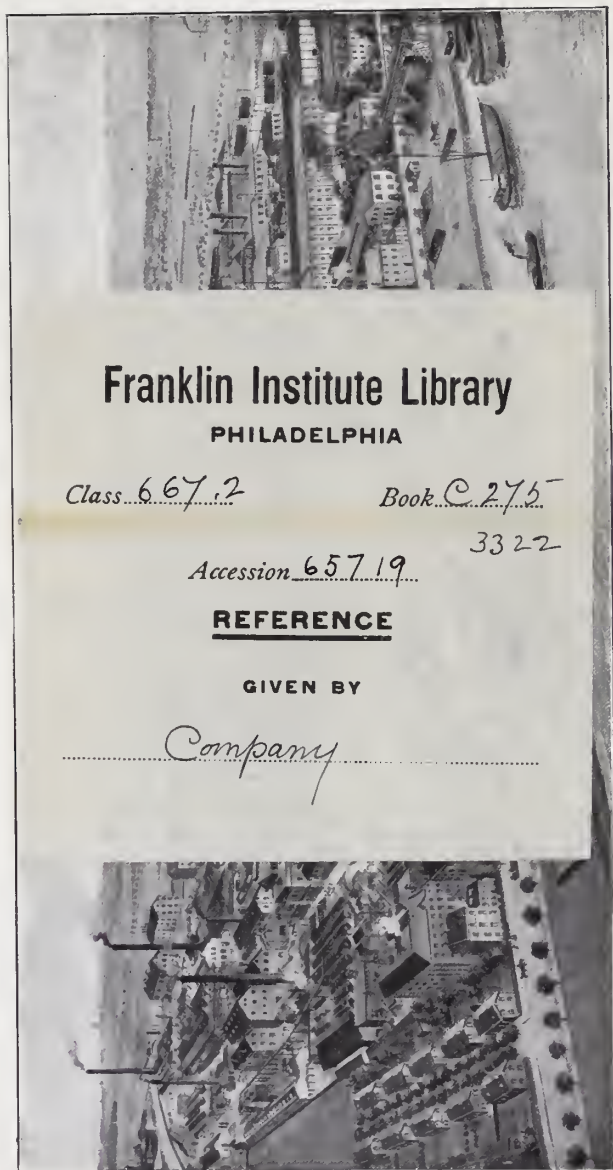
Providence: 64 Exchange Place.

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Montreal, Canada, 59, William Street.



LEOPOLD CASSELLA & Co., G. m. b. H., FRANKFORT o. M.



Works at Mainkur near Frankfort o. M.

HYDRON BLUE G AND R

PATENTED

PASTE 20⁰/₀ AND POWDER

CASSELLA COLOR COMPANY



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BOSTON: 39 OLIVER STREET

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MONTREAL: CANADA: 59 WILLIAM STREET.

1911.

UNITED STATES
ARMY

HYDRON BLUE G AND R

PAT.

PASTE 20% AND POWDER.

The two products belong to a new group of Vat Dyestuffs, and are distinguished for their excellent properties of fastness as well as for their particularly good levelling properties.

They are dyed on cotton with Hydrosulphite and caustic soda, and may be applied in a similar manner for any other vegetable fibre, such as linen, china-grass, etc.

Properties:

Fastness to Light: Both products possess eminent fastness to light:

Hydron Blue R: IV—V,

Hydron Blue G: V.

Indigo, which forms the basis for our classification, and in fastness to light is represented by "IV", is considerably surpassed by these two new products, particularly by Hydron Blue G.

Fastness to Washing: Excellent.

The dyeings are not altered in shade even by the severest washing, and white cotton is not stained. They likewise resist boiling with soda very satisfactorily.

Fastness to Acids: Very good.

The dyeings admirably resist a severe boiling with acids without staining white wool contiguous to the dyed cotton.

Fastness to Chloring

and Bleaching: The dyeings excellently resist a washing with the addition of chloride of lime, and are superior to Indigo dyeings in this respect.

For articles also which are woven in the grey and bleached in the piece, Hydron Blue may be used to advantage; the preliminary boiling should be carried out with Turkey-red oil and the bleaching with hypochlorite of soda. See page 11.

Fastness to Stoving: Very good.

Fastness to Hot

Pressing: Very good.

Fastness to Rubbing: Very good.

It has moreover to be mentioned particularly that Hydron Blue dyeings retain their shade in the sizing much better than other dyestuffs, which become much paler in the sizing, especially so in the case of dark shades.

The method of dyeing with Hydron Blue is very simple, and is carried out as follows:

Loose Cotton is dyed in wooden, copper, or iron vessels. The cotton is wetted out and then dyed at 50—60° C. (120—140° F.). After the dyeing, the goods are thrown out, hydroextracted, then left lying for some time exposed to the air in order to oxidise, and finally rinsed. When dyeing loose cotton in apparatus, the goods are rinsed straightaway after the dyeing, and then oxidised.

Yarn is best dyed on bent sticks, whereupon it is squeezed or wrung off, oxidised, and rinsed. Straight sticks may likewise be used, but in such case it is recommended to increase the amount of the reducing agent to some extent, and to turn or immerse the goods more frequently.

Piece-goods are dyed in the jigger, padding machine or continuous machine; after squeezing off evenly, the goods are given a short air passage, whereupon they are rinsed warm.

Cheeses, Cops, Warps and Roving may be dyed in any kind of mechanical apparatus, which may be made of wood, copper, iron or nickeline, provided only that the liquor can be removed evenly by suction after the dyeing.

The Hydron Blues offer a great advantage in as far as they dye much more easily and evenly in apparatus than the other Vat Blues.

DIRECTIONS FOR DYEING.

Dissolving Hydron Blue.

The *paste products* may be dissolved straightaway in the dye-bath. The dyestuff is mixed with as soft a water as is available and the requisite amount of lye, and then added to the warm bath. Then the Hydrosulphite previously dissolved with cold water is stirred in. In a few minutes complete solution is accomplished.

The *powder products* before being added to the bath are slowly made into a paste with five times their weight of cold or lukewarm water as free from lime as possible, to which $\frac{1}{2}$ —1 gallon methylated spirits per 10 gallons water has been added. This paste is then added through a fine sieve to the liquor, any portions remaining behind being crushed and washed in with water. Hereafter the lye and Hydrosulphite are added as in the case of the paste products.

DYEING OF COTTON YARN IN THE VESSEL.

Preparing the Yarn. A good wetting or preliminary boiling of the goods is essential. For the boiling, the yarn is placed in layers hank by hank in wooden or iron vessels or boilers, and then boiled for some hours, either open or with pressure, with 3—5% soda ash, Turkey-red oil or Monosolvol, or 2—3% caustic soda lye, and hereafter rinsed.

In the case of pale and bright shades, the cotton yarn is frequently bleached before dyeing.

Dyeing. The dyebath, with a volume of liquor of about 20 times the weight of the goods, is charged approximately as follows:

Hydron Blue G Powder and R Powder.

<u>For light and medium shades:</u>	Starting bath:	Subsequent lots:
Dyestuff	0.4— 3 %	0.4— 2.4%
Hydrosulphite conc. Powder	2 — 7.5%	2 — 6 %
Caustic soda lye 77° Tw.	2 — 7.5%	2 — 4 %
<u>For deep shades:</u>	Starting bath:	Subsequent lots:
Dyestuff	4 — 6 %	3 — 4.4%
Hydrosulphite conc. Powder	10 — 15 %	7.5—11 %
Caustic soda lye 77° Tw.	10 — 15 %	6 — 8 %

Hydron Blue G and R Paste 20%.

<u>For light and medium shades:</u>	Starting bath:	Subsequent lots:
Dyestuff	2 —15 %	2 —12 %
Hydrosulphite conc. Powder	2 — 7.5%	2 — 6 %
Caustic soda lye 77° Tw.	2 — 7.5%	2 — 4 %
<u>For deep shades:</u>	Starting bath:	Subsequent lots:
Dyestuff	20 —30 %	15 —22 %
Hydrosulphite conc. Powder	10 —15 %	7.5—11 %
Caustic soda lye 77° Tw.	10 —15 %	6 — 8 %

An addition of Turkey-red oil or Monosolvol will retard the absorption and thus effect a better penetration in the case of hard-twisted yarns.

At a temperature of about 50—60° C. (120—140° F.) the caustic soda lye and the dyestuff are added to the bath, whereupon the Hydrosulphite is stirred in slowly in powder form or to better advantage previously dissolved in cold water, the bath being stirred well until the liquor has assumed a completely yellow colour.

The dyeing is done at 50—60° C. (120—140° F.) for ½ to 1 hour. It is advisable to dye on bent iron rods if the requirements for levelness are particularly exacting.

The dyeing may however be done also on straight sticks, but in such case it is advisable to use an increased amount of Hydrosulphite, and to turn the goods more frequently. Instead of turning frequently, the yarn may after turning a few times over be submersed below the surface of the liquor; it is then sufficient to turn the yarn twice during the dyeing.

While dyeing with Hydron Blue the bath should appear reduced to a golden yellow, and the parts coming out of the liquor during the turning must have a light yellow colour and not show up blue or green. If the latter is the case, the amount of reducing and dissolving agent is insufficient, so some Hydrosulphite should first be added and then some lye also, if necessary.

Before lifting the yarn, it is given two or three consecutive turns, and squeezed off stick by stick. It is then as a rule wrung off immediately, exposed to the air for ½ to 1 hour in order to oxidize better, and rinsed thoroughly.

TREATMENT SUBSEQUENT TO THE DYEING.

Instead of wringing off and exposing to the air after the dyeing, an oxidation may be effected by an aftertreatment with perborate. Add $\frac{1}{2}$ — $\frac{3}{4}$ % perborate of soda to the last rinsing bath, raise the temperature to 40—50° C. (105—120° F.), and treat for 10 to 15 minutes.

Considerably brighter dyeings are obtained by a stronger treatment with perborate after the rinsing. Add 1—2% perborate of soda to the bath at 50—60° C. (120—140° F.), enter the yarn, raise gradually to boiling temperature, and treat for about 30 minutes in all.

Aftertreatment with Sulphate of Copper. An improvement in the fastness to boiling and light, which are already excellent, may be effected by aftertreating for 20 to 30 minutes in a hot bath with 3—4% sulphate of copper and 3—5% acetic acid.

The aftertreated dyeings are finally well rinsed as usual.

DYEING OF MERCERISED COTTON YARN.

Mercerised cotton yarn is dyed and aftertreated in exactly the same manner as described above for ordinary cotton yarn. Mercerised yarn however absorbing the dyestuff much more rapidly than ordinary yarn, it is advisable in every case to add a little Monosolvol or Turkey-red oil to the bath, and for pale shades to increase also the amount of Hydrosulphite, and further also to commence the dyeing at a lower temperature, and to raise the temperature gradually.

DYEING OF LINEN YARN.

Linen yarn is dyed in the same way as indicated for cotton yarn in the directions given on pages 3 to 5, all the difference being that it is advisable to add a little Turkey-red oil or Monosolvol to the bath, and the amount of dyestuff may also be slightly reduced.

DYEING OF LOOSE COTTON IN OPEN VESSELS OR KETTLES.

The Hydron Blues are dyed on loose cotton in the same kinds of vessels or kettles as are used for other dyestuffs, which may consist of wood, copper or iron.

The dyebaths are charged in the same manner as for cotton yarn.

Before dyeing, it is best to wet out the cotton with boiling hot water to which a little soda ash, Turkey-red oil or Monosolvol has been added. Dye for $\frac{1}{2}$ to 1 hour whilst turning in the usual manner, throw out, whizz if possible, and allow to oxidise in the air for some time; hereafter rinse thoroughly.

Further methods of aftertreatment which may be mentioned are those indicated for cotton yarn.

MACHINE-DYEING.

LOOSE COTTON.

Loose cotton is dyed in apparatus exclusively according to the packing system. For this purpose the cotton is packed tightly into the receptacle. Frequently water is run on to the cotton, which tightens the packing and renders it possible to pack a larger quantity of cotton into the receptacle.

SLIVER AND ROVING.

These are dyed in various forms, particularly the following:

In loose rolls in the same kind of packing apparatus and in the same manner as loose cotton;

in form of bobbins as roving by the spindle system, in which case the material after dyeing is dried on the bobbins;

as sliver in a continuous passage. As the dyeing is done in very short passages, the dyebath must be considerably more concentrated than usual. The indications regarding the dyeing of warps in continuous dyeing machines on page 9 will serve as a guide.

CHEESES AND COPS.

Cheeses are dyed both according to the packing and the spindle system. Cops are dyed to best advantage by the spindle system, which is employed almost exclusively.

WARPS.

Warps are dyed according to various methods, usually by a continuous passage in warp-dyeing machines; see page 9.

They are frequently also dyed wound on to perforated beams, which are placed in dyeing machines, the liquor being forced through the warps in exactly the same manner as in the case of cheeses and cops.

Occasionally also the warps are dyed according to the packing system, packed tightly into the apparatus.

DYEING IN PACKING AND SPINDLE APPARATUS.

PREPARING FOR THE DYEING.

Before dyeing, the material must be wetted well or boiled. This is done for 20 to 30 minutes in a boiling hot bath, to which a little Turkey-red oil, Monosolvol or soda may be added in the case of soft water in order to facilitate the wetting. After the wetting, the goods are rinsed once cold in order to cool them off.

In the case of light shades the material is frequently also bleached. This is best done with hypochlorite of soda and a subsequent souring off with hydrochloric acid. Attention should be paid to the usual neutralising of the chlorine and acid in the goods.

DYEING.

The dyebaths are charged per 100 lbs material and the usual volume of liquor with approximately the following quantities:

Hydron Blue G and R Powder.

<u>For light and medium shades:</u>	<u>Starting bath:</u>	<u>Subsequent lots:</u>
Dyestuff	6 oz— 3 lbs	6 oz— $2\frac{3}{8}$ lbs
Hydrosulphite conc. Powder	$2\frac{1}{2}$ — $7\frac{1}{2}$ „	2 — 6 „
Caustic soda lye 77° Tw.	$2\frac{1}{2}$ — $7\frac{1}{2}$ „	2 — 4 „
<u>For deep shades:</u>	<u>Starting bath:</u>	<u>Subsequent lots:</u>
Dyestuff	4 — 6 lbs	3 — $4\frac{3}{8}$ lbs
Hydrosulphite conc. Powder	10 — 15 „	$7\frac{1}{2}$ — 11 „
Caustic soda lye 77° Tw.	10 — 15 „	6 — 8 „

Hydron Blue G and R Paste 20%.

<u>For light and medium shades:</u>	<u>Starting bath:</u>	<u>Subsequent lots:</u>
Dyestuff	2 — 15 lbs	3 — 12 lbs
Hydrosulphite conc. Powder	$2\frac{1}{2}$ — $7\frac{1}{2}$ „	2 — 6 „
Caustic soda lye 77° Tw.	$2\frac{1}{2}$ — $7\frac{1}{2}$ „	2 — 4 „
<u>For deep shades:</u>	<u>Starting bath:</u>	<u>Subsequent lots:</u>
Dyestuff.	20 — 30 lbs	15 — 22 lbs
Hydrosulphite conc. Powder	10 — 15 „	$7\frac{1}{2}$ — 11 „
Caustic soda lye 77° Tw.	10 — 15 „	6 — 8 „

Add the caustic soda lye and dyestuff at 50—60° C. (120—140° F.), stir in the Hydrosulphite conc. gradually in powder form, or to better advantage dissolved previously in cold water, and stir thoroughly until the liquor has turned completely yellow. Hereafter dye for $\frac{1}{2}$ to 1 hour at 50—60° C. (120—140° F.).

During the dyeing with Hydron Blue the bath must be in a well reduced condition. The liquor should be golden yellow and not have a blue or greenish appearance. In the latter case there is a deficiency of reducing and dissolving agent, so a little more Hydro-sulphite, and afterwards a little lye, if necessary, should be added.

TREATMENT AFTER THE DYEING.

When the dyeing is complete, the goods must be freed as far as possible from liquor, which is removed from the goods either by pumping, whizzing or suction with a vacuum.

After dyeing in packing apparatus, the liquor is usually drawn off by means of a pump and pressed back into the reservoir, whereupon the goods are rinsed first with cold and then with warm water. If the packing apparatus is combined with a hydroextractor, the goods are at first rinsed once, then hydroextracted, and after this thoroughly rinsed.

When dyeing on spindles it is best to remove the liquor by vacuum, whereupon the goods are rinsed. If it is not possible to draw off the liquor sufficiently well by means of a vacuum, it is removed with a pump, whereupon the goods are submersed as quickly as possible in water in order to prevent the outer layers from oxidising; to enhance the effect of the rinsing, it is an advantage to use warm water for this purpose.

The goods dyed by the packing system, in cheeses, or in form of loose cotton, etc., are to advantage left for some time lying exposed to the air after rinsing and whizzing, in order to oxidise.

The same effect may be obtained by applying one of the following treatments:

a) *Treatment with Perborate.* Add about $\frac{1}{4}$ —1% perborate of soda to the last rinsing bath, to best advantage in two lots, raise the temperature to 40—45° C. (105—115° F.), and allow the perborate to act for 15 to 20 minutes.

b) *Aftertreatment with Bichrome and Acetic Acid.* First add 3—5% acetic acid to a cold to warm bath, and then 2—3% bichrome, allowing these to act for 15 to 20 minutes.

c) *Treatment with Bichrome and Bisulphite.* Add $\frac{1}{2}$ —1% bichrome to the cold to warm bath, allow same to act a few minutes, then add 3—6 oz bisulphite per 10 gallons to the same bath, treat for a few minutes, and rinse.

The aftertreated dyeings are finally well rinsed as usual.

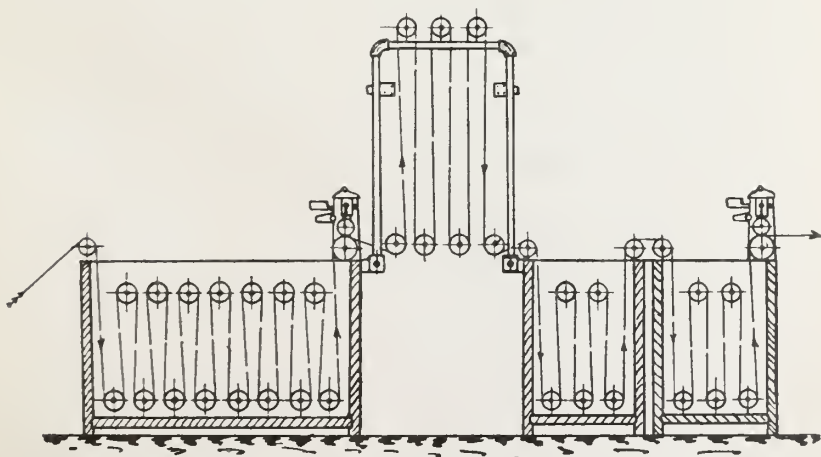
The brightness may be considerably enhanced by the following treatment with perborate subsequent to the rinsing:

Add 1—2% perborate of soda in two lots to the fresh bath of 40—50° C. (105—120° F.), raise the temperature gradually to the boil, and treat for about $\frac{1}{2}$ hour in all; hereafter rinse.

DYEING OF WARPS IN THE CONTINUOUS DYEING MACHINE.

Warps may be dyed with Hydron Blue in any kind of warp-dyeing machine provided with squeezing rollers and arrangements for oxidising.

Below is a sketch of the machine in which the dyeing may be effected in one passage. The drawing shows two vats for rinsing after the passage through the air for oxidation.



For Hydron Blue G and R P o w d e r , the dyebaths are charged as follows:

	For light and medium shades:		For deep shades:	
Dyestuff	1 ½—4 ½ oz	} per 10 gallons liquor.	6—9 oz	} per 10 gallons liquor.
Hydrosulphite conc. Powder	4 ½—11 „		1—1 ½ lbs	
Caustic soda lye 77° Tw.	4 ½—11 „		1—1 ½ „	

During the dyeing the dyebaths are strengthened with —

	For light and medium shades:		For deep shades:	
Dyestuff	0,7 — 2,4 %	} reckoned on the weight of the warps to be dyed.	3 — 4 %	} reckone on the weight of the warps to be dyed.
Hydrosulphite conc. Powder	1,75— 6 %		7,5—10 %	
Caustic soda lye 77° Tw.	1,75— 4 %		5 — 6 %	

For Hydron Blue G and R P a s t e 20%, the dyebaths are charged as follows:

	For light and medium shades:		For deep shades:	
Dyestuff	8 oz—1 ½ lbs	} per 10 gallons liquor.	2—3 lbs	} per 10 gallons liquor.
Hydrosulphite conc. Powder	4 ½—11 oz		1—1 ½ „	
Caustic soda lye 77° Tw.	4 ½—11 „		1—1 ½ „	

During the dyeing the dyebaths are strengthened with —

	For light and medium shades:		For deep shades:	
Dyestuff	3,5 —12 %	} reckoned on the weight of the warps to be dyed.	15 —20 %	} reckoned on the weight of the warps to be dyed.
Hydrosulphite conc. Powder	1,75— 6 %		7,5—10 %	
Caustic soda lye 77° Tw.	1,75— 4 %		5 — 6 %	

Add the caustic soda lye and the dyestuff at 50—60° C. (120—140° F.), stir in the Hydrosulphite gradually in powder form, or to better advantage dissolved in cold water, and agitate well until the liquor is completely yellow. Regarding the reduction of the powder product to a paste see page 3.

The warps, previously boiled, or well wetted and then whizzed or squeezed off, are dyed at 50—60° C. (120—140° F.), squeezed off very well and evenly, given a passage through the air, and rinsed thoroughly.

If there are no guiding rollers for the air passage, the warps after the squeezing off are rinsed straightaway and then left lying for a few hours in a damp condition. The oxidation may be accelerated by an aftertreatment with perborate in a warm bath, which is carried out as indicated on pages 8 and 9.

BLEACHING OF PIECE-GOODS CONTAINING YARN DYED WITH HYDRON BLUE.

For certain styles, unbleached yarn is woven up with other yarn and then bleached in the piece. It is a well-known fact that only few dyestuffs will withstand this operation, and even then special precautions have to be taken in bleaching. The Hydron Blues are very well suited for this purpose. The pieces containing yarn dyed with Hydron Blue are bleached in the following manner:

Boil the pieces for about 1 hour in a jigger with 4—8 oz Turkey-red oil or Monosolvol per 10 gallons, and rinse; then bleach for a few hours with hypochlorite of soda of $\frac{3}{4}$ —1° Tw. in the customary manner, rinse once or twice, and sour off for 20 to 30 minutes in hydrochloric acid of $\frac{1}{2}$ ° Tw.

Hereafter enter into a fresh bath containing $\frac{3}{4}$ —1½ oz sodium bisulphite per 10 gallons, allow this to react for 15 to 20 minutes, rinse thoroughly, and finally soap if necessary.

Hypochlorite of soda is prepared as follows:

100 lbs of chloride of lime 33% are rubbed with 40 gallons of water to a paste, and 60 lbs of soda ash are dissolved in 20 gallons of boiling water and diluted with 10 gallons of cold water. The soda solution is added to the paste of chloride of lime and the mixture stirred for $\frac{1}{2}$ hour and allowed to settle overnight. The clear solution is drawn off and the precipitate washed 4 or 5 times with cold water, the wash water being used to dilute the solution to 150 gallons of 6—7° Tw. It may be entirely freed from lime by the addition of 1—2 lbs soda ash, which precipitates the remaining lime. The solution reacts somewhat alkaline.

DYEING OF PIECE-GOODS.

On piece-goods, Hydron Blue may be dyed

- a) in the jigger
- b) in the padding machine
- c) in the continuous dyeing machine
- d) in the vat.

a) DYEING IN THE JIGGER.

For this purpose the customary jigger with squeezing rollers and arrangements for oxidising is used. Occasionally the jigger with the guide rollers submersed in the liquor is used, particularly for goods which are hard to penetrate.

The dyeing is carried out according to the following directions:

HYDRON BLUE G AND R POWDER.

<u>For light shades:</u>	<u>Starting bath:</u>	<u>Subsequent lots:</u>
Dyestuff	0.6 — 2%	0.6 — 1.6 %
Hydrosulphite conc. Powder	3 — 6%	3 — 5 %
Caustic soda lye 77° Tw.	3 — 5%	3 — 4 %
<u>For medium shades:</u>		
Dyestuff	2 — 4%	1.6 — 3 %
Hydrosulphite conc. Powder	6 — 12%	5 — 9 %
Caustic soda lye 77° Tw.	5 — 10%	4 — 6 %
<u>For deep shades:</u>		
Dyestuff	4 — 6%	3 — 4.4%
Hydrosulphite conc. Powder	12 — 18%	9 — 14 %
Caustic soda lye 77° Tw.	10 — 15%	6 — 8 %

HYDRON BLUE G AND R PASTE 20%.

<u>For light shades:</u>	<u>Starting bath:</u>	<u>Subsequent lots:</u>
Dyestuff	3 — 10%	3 — 8 %
Hydrosulphite conc. Powder	3 — 6%	3 — 5 %
Caustic soda lye 77° Tw.	3 — 5%	3 — 4 %
<u>For medium shades:</u>		
Dyestuff	10 — 20%	8 — 15 %
Hydrosulphite conc. Powder	6 — 12%	5 — 9 %
Caustic soda lye 77° Tw.	5 — 10%	4 — 6 %
<u>For deep shades:</u>		
Dyestuff	20 — 30%	15 — 22 %
Hydrosulphite conc. Powder	12 — 18%	9 — 14 %
Caustic soda lye 77° Tw.	10 — 15%	6 — 8 %

Hydron Blue Powder is mixed to a paste with water containing methylated spirits as indicated on page 3 and added to the bath of about 60° C. (140° F.) through a fine sieve.

The paste products are mixed with a little water and added straight to the dyebath. The caustic soda lye is then added and hereafter the requisite amount of Hydrosulphite, which is best dissolved beforehand in cold water. The liquor is then stirred until completely yellow. When dyeing goods which are difficult to dye through, it is well to add 3—5 oz Turkey-red oil or Monosolvol per 10 gallons of dye liquor.

The dyebath as well as the goods must appear entirely yellow during the dyeing. If the selvages of the goods begin to assume a dark appearance, some Hydrosulphite must be added.

The goods, after being well freed from size and prepared for the dyeing, are dyed at about 60—70° C. (140—160° F.) in 8 to 10 passages in a jigger provided with squeezing rollers. Towards the end of the dyeing operation the temperature may to advantage be somewhat increased.

The goods are then squeezed off evenly and oxidised by means of a passage through the air; hereafter they are thoroughly rinsed.

EXAMPLE FROM PRACTICE FOR MEDIUM BLUE.

100 lbs twilled goods.

50 gallons liquor.

Starting bath :

1½ lbs Hydron Blue G Powder or 7½ lbs Paste 20%.

1½ „ Hydron Blue R Powder or 7½ lbs Paste 20%.

9 „ Hydrosulphite conc. Powder.

8 „ Caustic soda lye 77° Tw.

Additions for subsequent lots :

19 oz Hydron Blue G Powder or 6 lbs Paste 20%.

19 „ Hydron Blue R Powder or 6 lbs Paste 20%.

7½ lbs Hydrosulphite conc. Powder.

5 „ Caustic soda lye 77° Tw.

The goods prepared for dyeing and well freed from size are dyed at about 60—70° C. (140—160° F.). After the last passage they are squeezed off without batching and passed over several guiding rollers in order to oxidise, being then immediately and thoroughly rinsed in a second jigger standing ready for the purpose.

b) DYEING IN THE PADDING MACHINE.

The dyeing in the padding machine is done in the customary manner with the same ingredients as for dyeing in the jigger. It is well to select as large a trough as possible for the purpose. According to the shade desired, the goods are passed once or several times through the padding machine. By subsequently adding a stronger colour solution the dyebath is correspondingly strengthened.

Light and medium shades may likewise be produced by padding. The goods, which have previously been freed from size and then dried, are passed through the usual small padding trough, which, according to the shade desired, is charged with

- 3—12 oz Hydron Blue Powder or 1—4 lbs Hydron Blue Paste 20%
 - 1— 4 lbs Hydrosulphite conc. Powder
 - ½— 2 lbs Caustic soda lye 77° Tw.
 - 5 oz Turkey-red oil or Monosolvol
- per 10 gallons liquor.

The temperature of the dye liquor is maintained at 60—80° C. (140—175° F.) in the usual manner by heating with indirect steam. The liquor is prepared in the required strength, in a vessel placed above the other, and is allowed to flow continually into the padding trough during the dyeing. After the squeezing off, the goods pass over some guiding rollers through the air in order to oxidise, and are then rinsed thoroughly in the usual manner.

As a rule the dyeing may be completed in one passage; only for deeper shades a second passage may have to be considered.

c) DYEING IN THE CONTINUOUS DYEING MACHINE.

This method comes mainly into consideration for lighter qualities of goods. For dyeing medium blue, for instance, the bath is charged with

- | | | |
|--|---|------------------------|
| 2 ⁷ / ₈ —5 ³ / ₄ oz Hydron Blue G Powder | } | per 10 gallons liquor. |
| 2 ⁷ / ₈ —5 ³ / ₄ oz Hydron Blue R Powder | | |
| 1 lb 3 oz—2 lbs 6 oz Hydrosulphite conc. Powder | | |
| 1 —2 lbs Caustic soda lye 77° Tw. | | |
| 3 —5 oz Turkey-red oil or Monosolvol | | |

During the dyeing the dyebath is strengthened with

- | | | |
|---------------------------------------|---|--------------------------------------|
| 0.9— 1.8% Hydron Blue G powder | } | reckoned on the weight of the goods. |
| 0.9— 1.8% Hydron Blue R Powder | | |
| 5.5—11 % Hydrosulphite conc. Powder | | |
| 4 — 7 % Caustic soda lye 77° Tw. | | |
| 0.5— 1 % Turkey-red oil or Monosolvol | | |

Dye in one passage at 60—70° C. (140—160° F.), then squeeze off, pass over some guiding rollers in order to oxidise, and rinse well.

d) DYEING IN THE VAT.

The dyeing in the vat is carried out in the same manner as customary for Indigo, except that only one passage is necessary even for deep shades.

The vat is to advantage heated a little in order to accelerate the absorption of the dyestuff.

The usual good rinsing follows the dyeing.

The relative proportions of caustic soda lye and dyestuff are the same as indicated for dyeing in the jigger.

AFTERTREATMENT WITH PERBORATE.

If particularly bright shades are desired, these may easily be obtained by an aftertreatment with perborate. The aftertreatment is carried out by adding $\frac{1}{2}$ —1% perborate of soda to the last rinsing bath and treating the goods therein for some time while gradually raising the bath to the boil.

'DYEING OF MERCERISED FABRICS.

The same method and the same additions are required as indicated for ordinary piece-goods, the only difference being that the amount of dyestuff is reduced by about one-quarter, that of Hydro-sulphite on the other hand rather being increased and a little Turkey-red oil or Monosolvöl being added to the dyebath.

DYEING OF LINEN AND HALF-LINEN FABRICS.

Linen and half-linen piece-goods are dyed principally in the ordinary jigger provided with squeezing rollers and arrangements for oxidising, in the same manner and with the same additions as in the case of cotton piece-goods, except that the amount of dyestuff may be reduced by about one-third.

In order to attain good penetration, the duration of the dyeing should be prolonged a little, and in such case it is advisable also to dye in a jigger with the guide rollers submersed in the liquor.

E x a m p l e :

Dark Blue on 150 lbs unbleached Linen. 80 gallons liquor.

S t a r t i n g b a t h :

3	lbs 9½ oz	Hydron Blue G Powder or 18 lbs Paste 20%
	14½ „	Hydron Blue R Powder or 4½ lbs Paste 20%
15	„	Hydrosulphite conc. Powder
12	„	Caustic soda lye of 77° Tw.
4	„	Turkey-red oil or Monosolvol.

F o r s u b s e q u e n t l o t s :

2	lbs 6½ oz	Hydron Blue G Powder or 12 lbs Paste 20%
	11½ „	Hydron Blue R Powder or 3½ lbs Paste 20%
10½	„	Hydrosulphite conc. Powder
8	„	Caustic soda lye of 77° Tw.
2	„ 6 „	Turkey-red oil or Monosolvol.

After dyeing, squeeze off, pass through the air over a few guiding rollers in order to oxidise, and rinse thoroughly.

COMBINATIONS OF HYDRON BLUES WITH OTHER DYESTUFFS.

a) INDIGO AND OTHER VAT COLOURS

may be dyed together in the same bath with Hydron Blue according to the directions for Hydron Blue. It will only have to be borne in mind that some of the vat colours require more Hydrosulphite and caustic soda, and the quantities of these ingredients have to be increased accordingly.

Combinations with a large proportion of Indigo are dyed to advantage at a reduced temperature, say, about 40° C. (105° F.), and it has to be taken into consideration that three-quarters to four-fifths of the Indigo remain behind in the bath, while the Hydron Blue on the other hand is nearly exhausted.

Hydron Blue may likewise be applied as a bottom, the goods being topped with Indigo in any kind of Indigo vat in the customary manner.

b) DIAMINE, IMMEDIAL AND BASIC COLOURS.

These dyestuffs when dyed in combination with Hydron Blue are best used by topping the goods previously dyed with Hydron Blue in accordance with directions.

The *Diamine Colours* are in such case applied either in the usual manner, or, when only slight quantities are required, are added to the last rinsing bath or to a hot soap bath.

The topping with *Immedial Colours* is carried out by first dyeing with Hydron Blue and then topping with the Immedial Colours in a sodium sulphide bath.

Basic Colours are applied in a cold bath with the addition of 3—5% acetic acid, the dyestuff being added in several portions and the baths then heated gradually to 40—50° C. (105—120° F.). The goods are then well rinsed.

HYDRON BLUE FOR PRINTING.

The two Hydron Blue brands are very well suited for printing purposes, both on account of their excellent fastness to washing, light and chloring, and by reason of their simple method of application; they may be used both for piece-goods and for yarns.

PRINTING OF PIECE-GOODS.

I. DIRECT PRINTING.

For direct printing, the following recipe has been found very suitable:

Printing directions for Hydron Blue G and R Paste 20%.

280—220	parts	hot water,
100—100	„	glycerine and
20—30	„	soda ash are mixed together and at about
		50° C. (120° F.)
40—100	„	dyestuff are added whilst stirring.
60—150	„	Hyraldite C extra 1:1 (dissolved in water)
		are then added, the whole is well agitated,
		and the warm solution added to
500—400	„	neutral thickening.
<hr/>		
1000	parts	

NEUTRAL THICKENING:

100	parts	Wheat starch,
400	„	British gum and
500	„	water are mixed and boiled.
<hr/>		
1000	parts	

After printing and drying, steam in a rapid ager at 100—102° C. (212—216° F.), with steam as free from air as possible; hereafter sour off lightly, to best advantage with the addition of a little bichrome (8 oz sulphuric acid and 3—5 oz bichrome per 10 gallons), wash, soap, rinse, and dry.

Somewhat brighter shades may be obtained by aftertreating with a weak solution of perborate of soda subsequent to the rinsing. For this purpose, $\frac{3}{4}$ —1½ oz perborate per 10 gallons are used, the printed goods being passed through the solution at 40—50° C. (105—120° F.).

The Hydron Blues may be combined to very good advantage with other vat colours also to be printed with the addition of Hyraldite and alkali, by which means various mode shades may likewise be obtained. As illuminating colours the other products, which may easily be fixed by a short steaming, come in the first place into consideration, that is to say, vat colours in particuar; for red, Paranitraniline Red may also be applied.

II. GREY PRINTS WITH HYDRON BLUE G AND R PASTE 20%.

(Patented Method.)

The combinations obtained by the action of bisulphite on Hydron Blue yield very fast grey prints, when printed with the addition of acetate of chrome.

PRINTING RECIPE:

150	parts	Hydron Blue G or R Paste 20% are mixed well with
150	„	bisulphite of 65° Tw., the mixture being allowed to stand overnight. Then
60	„	glycerine,
40	„	acetic acid 8° Tw. and
50	„	water are added, the whole being mixed with
470	„	neutral thickening, and finally
80	„	acetate of chrome of 32° Tw. are added.
<hr/>		
1000	parts.	

After printing and drying, the goods are either steamed for a few minutes in a rapid ager, or steamed without pressure in a cottage steamer, washed, soaped if necessary, rinsed, and dried.

III. SPRAY-PRINTING.

The Hydron Blues have proved very suitable also for spray-printing.

Directions for Spray Printing with Hydron Blue G and R Paste 20%.

600—510	parts	hot water,
50— 50	„	glycerine and
20— 30	„	soda ash are mixed together, and at about
		50° C. (120° F.)
40— 80	„	dyesuff (paste) are added whilst stirring.
40— 80	„	Hyraldite C extra 1:1 (dissolved in water)
		are added, the warm solution being well
		agitated and added to
250—250	„	British gum thickening 1:1.
<hr/>		
1000	parts.	

After spray-printing, dry and steam for about 5 minutes at 100—102° C. (212—216° F.) with steam as free from air as possible, and pass through a feebly acid chrome bath (8 oz sulphuric acid and 3—5 oz bichrome per 10 gallons), wash, soap, rinse, and dry.

The goods may also be treated with perborate as afore indicated (page 18).

IV. RESERVE PRINTING.

For resisting Hydron Blue, the same resists with copper and lead salts may be used as eustomary for Indigo resists. The dyeing may also be done in the dipping vat. On the other hand, the Hydron Blues being much easier to dye than Indigo and levelling better, an ordinary padding machine or a small roller-box with squeezing rollers may likewise be used, and on account of the simpler method of working this method is frequently applied.

The following dyeing directions will serve as a guide:

For light blue:	Medium blue:	Dark blue:	
2 lbs	2 lbs	2 lbs Hydron Blue G Paste 20%	} per 10 gallons liquor.
—	2 „	4 „ Hydron Blue R Paste 20%	
1 lb	2 „	3 „ Caustic soda lye 77° Tw.	
1 „	2 „	3 „ Hydrosulphite conc. Powder	
3 oz	3 oz	3 oz Turkey-red oil	

First add the caustic soda lye and the Turkey-red oil and dyestuff to the bath at about 50° C. (120° F.), then gradually add the Hydrosulphite dissolved in cold water, and stir well until the liquor is entirely yellow.

When using Hydron Blue Powder, the dyestuff is first mixed well to a paste with the addition of some alcohol as indicated on page 3, this paste being then added to the warm bath.

The goods printed with the resist are dyed at about 35—40° C. (95—105° F.) in one or two passages of about one minute each; in the latter case the goods are exposed to the air for a few minutes between the passages. They are then squeezed off, passed through the air over some guiding rollers, and finally washed, first in acidulated water (2—3 pints hydrochloric acid per 10 gallons) and then thoroughly in the usual manner in plain water.

The resists will withstand the short passage through a lukewarm bath allright, but the dyeing may also be done cold if this be preferred in one case or the other.

THE END

THE END

PRINTING OF COTTON YARN.

Hydron Blue G and R are likewise very well suited for the printing of cotton yarn. The printing directions are the same as given for direct printing of piece goods, except that the print paste should be kept a little more liquid, which is best attained by reducing the amount of neutral thickening correspondingly.

Without guarantee.

COTTON AND LINEN YARN.

Nos. 1—4. HYDRON BLUE PAT. G AND R ON COTTON YARN.

For directions for dyeing cotton yarn in the vessel see page 3.

No. 1.	3	% Hydron Blue G pat.	No. 2.	9%	Hydron Blue G pat.
		Paste 20%.			Paste 20%.
No. 3.	7	% Hydron Blue R pat.	No. 4.	16%	Hydron Blue R pat.
		Paste 20%.			Paste 20%.

Nos. 5—8. HYDRON BLUE PAT. G AND R ON LINEN YARN.

Dyeing directions on page 5.

No. 5.	2½	% Hydron Blue G pat.	No. 6.	6%	Hydron Blue G pat.
		Paste 20%.			Paste 20%.
No. 7.	8	% Hydron Blue R pat.	No. 8.	10%	Hydron Blue R pat.
		Paste 20%.			Paste 20%.

Nos. 9 and 10. HYDRON BLUE PAT. G AND R ON MERCERISED COTTON YARN.

Dyeing directions on page 5.

No. 9.	2	% Hydron Blue G pat.	No. 10.	6%	Hydron Blue G pat.
		Paste 20%.			Paste 20%.
				1%	Hydron Blue R pat.
					Paste 20%.

The quantities of dyestuff are to be understood for dyeing subsequent lots in the standing bath; the starting baths have to be charged in accordance with the directions on page 4.

COTTON AND LINEN YARN.

HYDRON BLUE G ON COTTON YARN.



HYDRON BLUE R ON COTTON YARN.



HYDRON BLUE G ON LINEN YARN.



HYDRON BLUE R ON LINEN YARN.



HYDRON BLUE G AND R ON MERCERISED COTTON YARN.



RANGE OF HYDRON BLUE TINTS ON COTTON.

For directions for dyeing cotton yarn in the vessel see page 3.

No. 11.	4	% Hydron Blue G pat. Paste 20%.
No. 12.	5,5	% Hydron Blue G pat. Paste 20%.
No. 13.	5	% Hydron Blue G pat. Paste 20%.
	1,75	% Hydron Blue R pat. Paste 20%.
No. 14.	6	% Hydron Blue G pat. Paste 20%.
	2	% Hydron Blue R pat. Paste 20%.
No. 15.	5	% Hydron Blue G pat. Paste 20%.
	3,5	% Hydron Blue R pat. Paste 20%.
No. 16.	5	% Hydron Blue G pat. Paste 20%.
	5	% Hydron Blue R pat. Paste 20%.
No. 17.	5	% Hydron Blue G pat. Paste 20%.
	7	% Hydron Blue R pat. Paste 20%.
No. 18.	4	% Hydron Blue G pat. Paste 20%.
	9	% Hydron Blue R pat. Paste 20%.
No. 19.	14	% Hydron Blue R pat. Paste 20%.

The quantities of dyestuff are to be understood for dyeing subsequent lots in the standing bath; the starting baths have to be charged in accordance with the directions on page 4.

RANGE OF HYDRON BLUE TINTS ON COTTON.

11



12



13



14



15



16



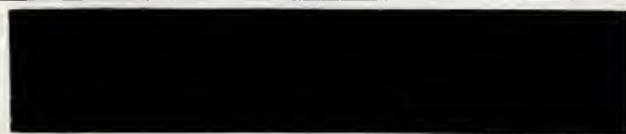
17



18



19



DYEINGS OF HYDRON BLUE aftertreated, or topped with Indigo.

Nos. 20—25 AFTERTREATED WITH PERBORATE OF SODA.

Dyed according to directions on pages 3 and 4, and aftertreated as given on page 5.

No. 20.	5% Hydron Blue G pat. Paste 20%.	No. 21.	8 % Hydron Blue G pat. Paste 20%.
No. 22.	4% Hydron Blue G pat. Paste 20%.	No. 23.	5 % Hydron Blue R pat. Paste 20%.
	2% Hydron Blue R pat. Paste 20%.		2 % Hydron Blue G pat. Paste 20%.
No. 24.	10% Hydron Blue R pat. Paste 20%.	No. 25.	13 % Hydron Blue R pat. Paste 20%.

Nos. 26 and 27 AFTERTREATED WITH SULPHATE OF COPPER.

Dyed according to directions on pages 3 and 4, and aftertreated as given on page 5.

No. 26.	12% Hydron Blue G pat. Paste 20%.	No. 27.	12 % Hydron Blue R pat. Paste 20%.
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Nos 28 and 29 COMBINATIONS WITH INDIGO.

For fuller particulars regarding combinations with Indigo see page 17.

No. 28.	4% Hydron Blue G pat. Paste 20%.	No. 29.	4,5% Hydron Blue G pat. Paste 20%.
	2% Hydron Blue R pat. Paste 20%.		4,5% Hydron Blue R pat. Paste 20%.
	topped with Indigo.		topped with Indigo.

The quantities of dyestuff are to be understood for dyeing subsequent lots in the standing bath; the starting baths have to be charged in accordance with the directions on page 4.

DYEINGS OF HYDRON BLUE
aftertreated, or topped with Indigo.

AFTERTREATED WITH PERBORATE OF SODA.



AFTERTREATED WITH SULPHATE OF COPPER.



COMBINATIONS WITH INDIGO.



HYDRON BLUE ON LOOSE COTTON.

For directions for dyeing in the vessel see page 5.

No. 30.	3% Hydron Blue G pat. Paste 20%.	No. 31.	5 % Hydron Blue G pat. Paste 20%.
No. 32.	9% Hydron Blue G pat. Paste 20%.	No. 33.	18 % Hydron Blue G pat. Paste 20%.
No. 34.	5% Hydron Blue R pat. Paste 20%.	No. 35.	7,5% Hydron Blue R pat. Paste 20%.
No. 36.	12% Hydron Blue R pat. Paste 20%.	No. 37.	18 % Hydron Blue R pat. Paste 20%.

The quantities of dyestuff are to be understood for dyeing subsequent lots in the standing bath; the starting baths have to be charged in accordance with the directions on page 4.

HYDRON BLUE ON LOOSE COTTON.

30



31



32



33



34



35



36



37



HYDRON BLUE DYED IN MECHANICAL APPARATUS.

For directions for machine-dyeing see page 6.

C O P S.

No. 38. 3 % Hydron Blue G pat. Paste 20%.

No. 39. 6 % Hydron Blue G pat. Paste 20%.

No. 40. 6 % Hydron Blue G pat. Paste 20%.

3 % Hydron Blue R pat. Paste 20%.

No. 41. 9 % Hydron Blue G pat. Paste 20%.

4 % Hydron Blue R pat. Paste 20%.

C H E E S E S.

No. 42. 5 % Hydron Blue G pat. Paste 20%.

1,5% Hydron Blue R pat. Paste 20%.

No. 43. 6 % Hydron Blue G pat. Paste 20%.

4 % Hydron Blue R pat. Paste 20%.

The quantities of dyestuff are to be understood for dyeing subsequent lots in a standing bath; the starting baths have to be charged in accordance with the directions on page 7.

HYDRON BLUE DYED IN MECHANICAL APPARATUS.

C O P S.

38



39



40



41



C H E E S E S.

42



43



HYDRON BLUE DYED ON WARPS AND SLIVER.

WARPS DYED IN THE CONTINUOUS DYEING MACHINE.

For dyeing directions see page 9.

- No. 44. 5% Hydron Blue G pat. Paste 20%.
 2% Hydron Blue R pat. Paste 20%.
- No. 45. 7% Hydron Blue G pat. Paste 20%.
 7% Hydron Blue R pat. Paste 20%.

SLIVER DYED IN APPARATUS.

For directions for machine-dyeing see page 6.

- No. 46. 4% Hydron Blue G pat. Paste 20%.
- No. 47. 12% Hydron Blue G pat. Paste 20%.
- No. 48. 10% Hydron Blue G pat. Paste 20%.
 8% Hydron Blue R pat. Paste 20%.

The quantities of dyestuff are to be understood for dyeing subsequent lots in the standing bath; the starting baths for dyeing in the continuous dyeing machine have to be charged in accordance with the directions on page 10, and for the dyeing of sliver the quantities are those indicated on page 7.

HYDRON BLUE DYED ON WARPS AND SLIVER.

WARPS DYED IN THE CONTINUOUS DYEING MACHINE.

44



45



SLIVER DYED IN APPARATUS.

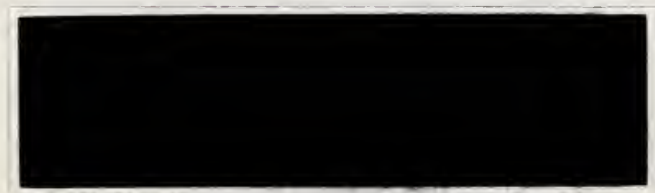
46



47



48



HYDRON BLUE ON COTTON FABRICS.

For directions for dyeing in the jigger with squeezing rollers see page 12.

No. 49. 4% Hydron Blue G pat. Paste 20%.

No. 50. 8% Hydron Blue G pat. Paste 20%.

No. 51. 12% Hydron Blue G pat. Paste 20%.

No. 52. 4% Hydron Blue R pat. Paste 20%.

No. 53. 10% Hydron Blue R pat. Paste 20%.

No. 54. 16% Hydron Blue R pat. Paste 20%.

The quantities of dyestuff stated are those absorbed by the fibre in the standing bath. The starting baths have to be charged in accordance with the directions on page 12.

HYDRON BLUE ON COTTON FABRICS.

HYDRON BLUE G.

49



50



51



HYDRON BLUE R.

52



53



54



HYDRON BLUE ON SHIRTING, AFTERTREATED WITH PERBORATE.

For directions for dyeing in the jigger with squeezing rollers see page 12.

No. 55. 5 % Hydron Blue G pat. Paste 20%.

No. 56. 6 % Hydron Blue G pat. Paste 20%.
2.5% Hydron Blue R pat. Paste 20%.

No. 57. 6 % Hydron Blue G pat. Paste 20%.
6 % Hydron Blue R pat. Paste 20%.

No. 58. 4 % Hydron Blue G pat. Paste 20%.
12 % Hydron Blue R pat. Paste 20%.

After dyeing and oxidising, the goods are rinsed well and aftertreated in the last rinsing bath in accordance with the directions on page 15 with

5% perborate of soda

in order to enhance the brightness of the dyeings. The bath is gradually heated to the boil.

The quantities of dyestuff stated are those absorbed by the fibre in the standing bath. The starting baths have to be charged in accordance with the directions on page 12.

HYDRON BLUE ON SHIRTING, AFTERTREATED WITH PERBORATE.

55



56



57



58



HYDRON BLUE ON CLOTH FOR WORKMENS CLOTHES.

For directions for dyeing in the jigger with squeezing rollers see page 12.

No. 59.	4 %	Hydron Blue G pat. Paste 20%.
	4 %	Hydron Blue R pat. Paste 20%.
No. 60.	2,5%	Hydron Blue G pat. Paste 20%.
	6 %	Hydron Blue R pat. Paste 20%.
No. 61.	7 %	Hydron Blue G pat. Paste 20%.
	7 %	Hydron Blue R pat. Paste 20%.
No. 62.	14 %	Hydron Blue G pat. Paste 20%.
	10 %	Hydron Blue R pat. Paste 20%.

The quantities of dyestuff stated are those absorbed by the fibre in the standing bath. The starting baths have to be charged in accordance with the directions on page 12.

HYDRON BLUE ON CLOTH FOR WORKMENS CLOTHES.

59



60



61



62



HYDRON BLUE ON DRESS MATERIAL.

For directions for dyeing in the jigger with squeezing rollers see page 12.

No. 63. 10% Hydron Blue G pat. Paste 20%.

No. 64. 12% Hydron Blue G pat. Paste 20%.
3% Hydron Blue R pat. Paste 20%.

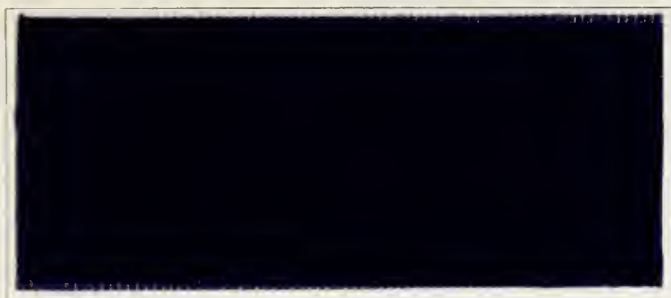
No. 65. 5% Hydron Blue G pat. Paste 20%.
3% Hydron Blue R pat. Paste 20%.

No. 66. 4% Hydron Blue G pat. Paste 20%.
16% Hydron Blue R pat. Paste 20%.

The quantities of dyestuff stated are those absorbed by the fibre in the standing bath. The starting baths have to be charged in accordance with the directions on page 12.

HYDRON BLUE ON DRESS MATERIAL.

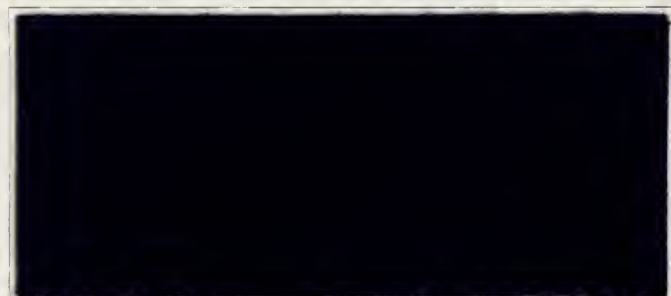
63



64



65



66



HYDRON BLUE ON LINEN AND HALF-LINEN.

Patterns Nos. 68 and 70 were dyed in the jigger with the guide rollers submerged in the liquor, Nos. 67 and 69 in the ordinary jigger provided with squeezing rollers, in both cases in accordance with the directions on page 15.

No. 67. 6% Hydron Blue G pat. Paste 20%.
6% Hydron Blue R pat. Paste 20%.

No. 68. 12% Hydron Blue R pat. Paste 20%.

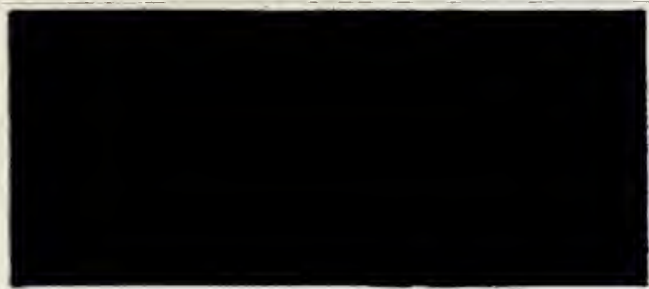
No. 69. 15% Hydron Blue R pat. Paste 20%.

No. 70. 3% Hydron Blue G pat. Paste 20%.
12% Hydron Blue R pat. Paste 20%.

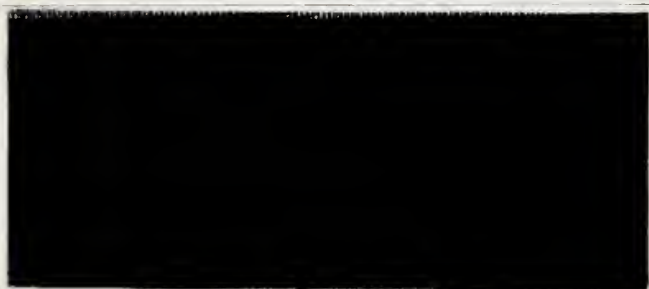
The quantities of dyestuff stated are those absorbed by the fibre in the standing bath. The starting baths have to be charged in accordance with the directions on page 12.

HYDRON BLUE ON LINEN AND HALF-LINEN.

67



68



69



70



SHIRTINGS AND BLOUSE MATERIALS BLEACHED IN THE PIECE.

Patterns No. 71 and 72. The Blue is hank-dyed in the vessel on Egyptian yarn with Hydron Blue G pat. and woven together with raw Egyptian yarn.

The corner pattern shows the shade before the bleaching.

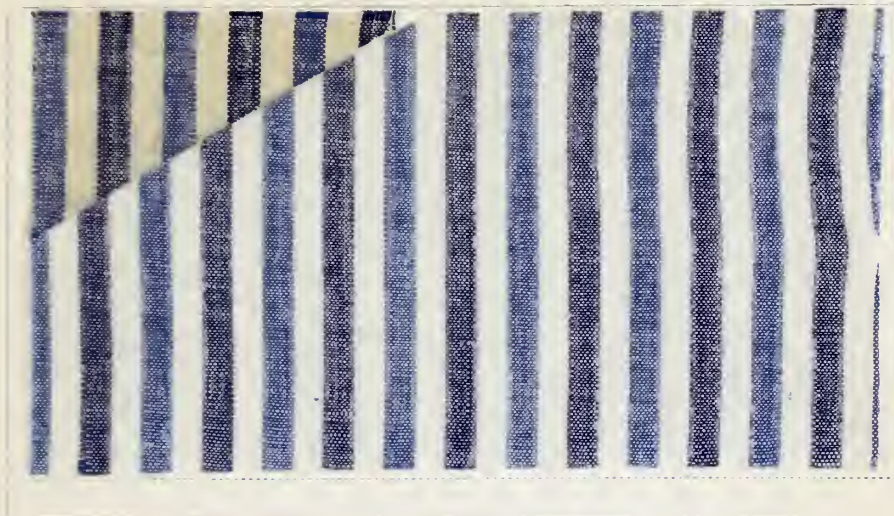
The pieces are bleached in the following manner:

The goods are boiled in the piece for about 1 hour with $\frac{1}{4}$ — $\frac{1}{2}$ lb Turkey-red oil or Monosolvol per 10 gallons liquor, rinsed, and bleached for a few hours in the customary manner with hypochlorite of soda $\frac{3}{4}$ —1^o Tw., rinsed again once or twice, and then soured off for 20 to 30 minutes in hydrochloric acid of $\frac{1}{2}$ ^o Tw.

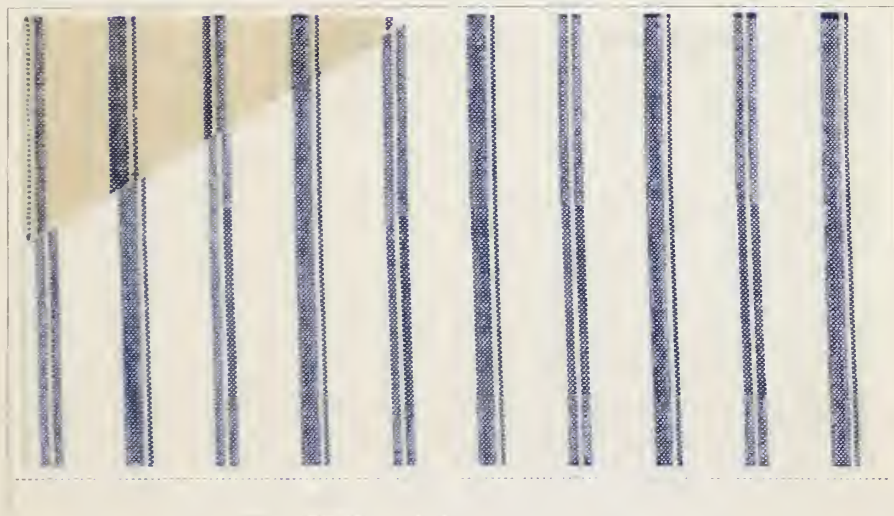
Then treat the goods in a fresh bath containing $\frac{3}{4}$ —1 $\frac{1}{2}$ oz bisulphite of soda per 10 gallons, leave therein for 15 to 20 minutes, rinse thoroughly, and finally soap if necessary.

The preparation of hypochlorite of soda is described on page 11.

71



72



LAWN-TENNIS GOODS BLEACHED IN THE PIECE.

Patterns No. 73 and 74. The Blue was dyed as follows on unbleached yarn in cheeses:

140 lbs cheeses to about 150 gallons liquor dyed in the machine by the packing system:

	Starting bath:	Additions for subsequent lots:
Hydron Blue G pat. Paste 20%	20 lbs	12½ lbs
Hydrosulphite conc. Powder	10 „	6¼ „
Caustic soda lye of 77° Tw.	10 „	5 „

Heat the bath to 55—60° C. (130—140° F.), add first the lye and then the dyestuff, and hereafter gradually add the Hydrosulphite previously dissolved in 6—10 gallons cold water.

After a few minutes, enter the receptacle containing the material to be dyed, which has been previously wetted for 20 minutes in boiling hot water and then rinsed cold once, and dye for about 30 minutes at 55—60° C. (130—140° F.).

After dyeing, give a short rinsing, hydroextract, and complete the rinsing.

If the water for rinsing remains clear, it is heated to 50° C. (120° F.), and about ½ lb perborate of soda is added, and after further 10 minutes another ½ lb of this ingredient is added. Altogether the perborate is allowed to act for 20 to 30 minutes.

The dyed yarn is then woven together with unbleached yarn, and bleached in the piece with Turkey-red oil and hypochlorite of soda according to the particulars given on page 33.

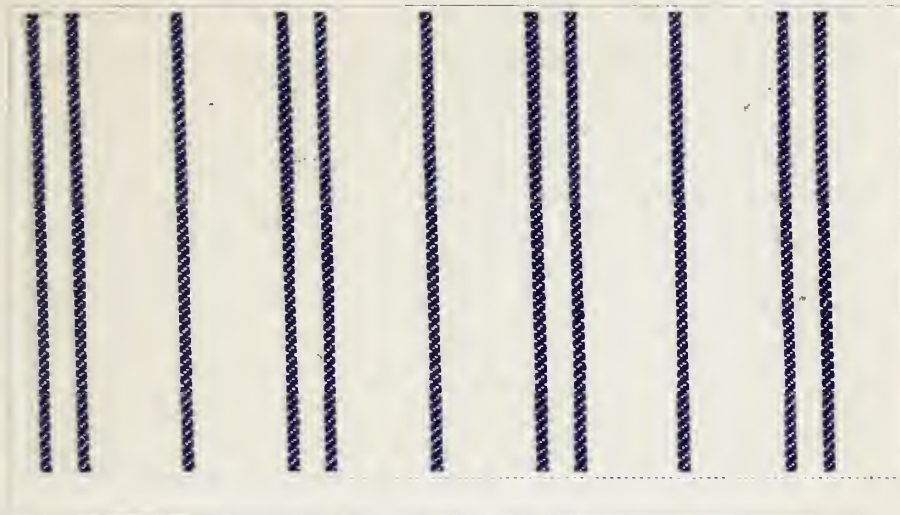
No. 73 was blued in a soap bath with Alizarine Cyanole EF pat. after the bleaching.

No. 74 was tinted in a soap bath with Diamine Fast Yellow FF pat. after the bleaching.

LAWN-TENNIS GOODS BLEACHED IN THE PIECE.

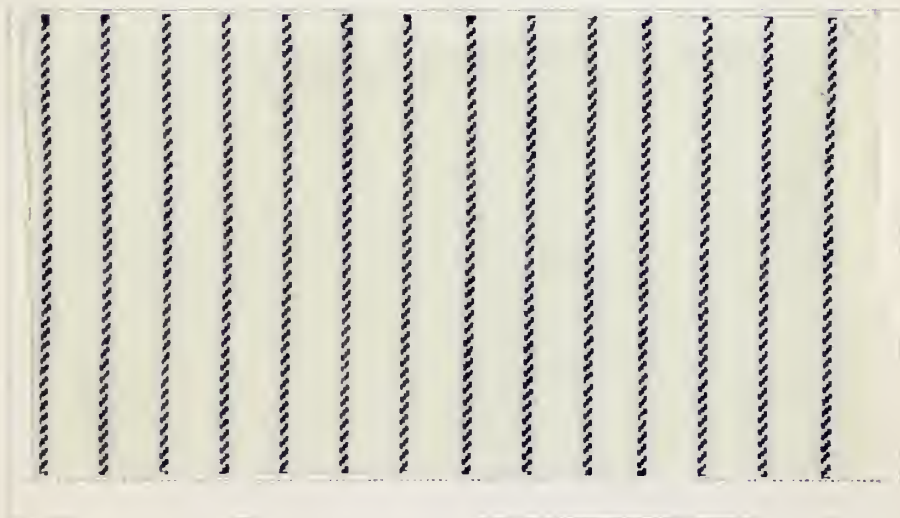
73

BLUED AFTER BLEACHING.



74

CREAMED AFTER BLEACHING.



FABRICS BLEACHED IN THE PIECE.

Nos. 75 and 76. The Blue is dyed on unbleached yarn with Hydron Blue G and R, and then woven up with unbleached yarn.

The pieces so produced are then boiled with Turkey-red oil and bleached with hypochlorite of soda as stated on page 11.

No. 75, after bleaching, is tinted with Diamine Fast Yellow in a soap bath.

The dyeing of the warp in pattern No. 76 on the beam in the apparatus is carried out as follows:

For 140 lbs warps in about 180 gallons liquor the bath is charged approximately as follows:

	Starting bath:	Additions for subsequent lots:
Hydron Blue G pat. Paste 20%	12½ lbs	8¼ lbs
Hydron Blue R pat. Paste 20%	4 „	3 „
Hydrosulphite conc. Powder	8 „	5½ „
Caustic soda lye of 77° Tw.	8 „	4 „

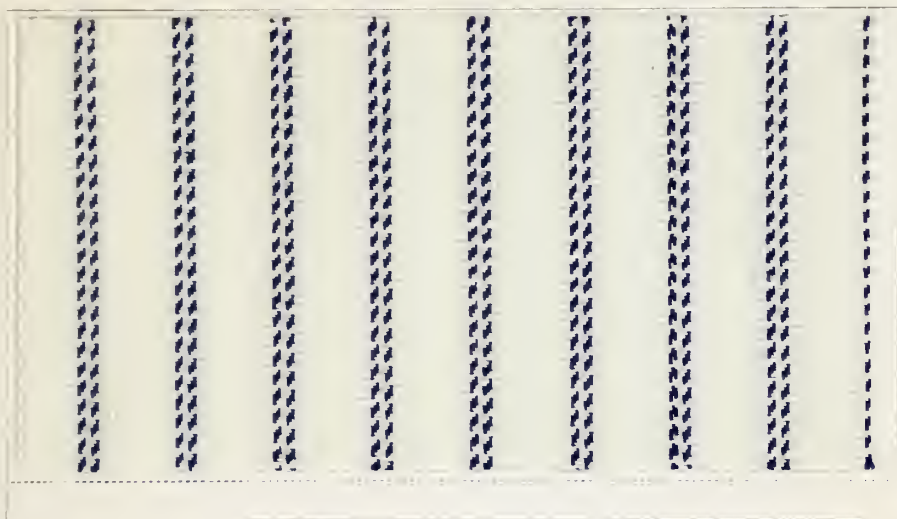
The warps are boiled for about ½ hour in soft water, and then rinsed once with cold water.

The caustic soda lye is added to the bath first, then the dyestuff, and then gradually the Hydrosulphite dissolved in cold water. The goods are then dyed for about an hour at 50—60° C. (120—140° F.).

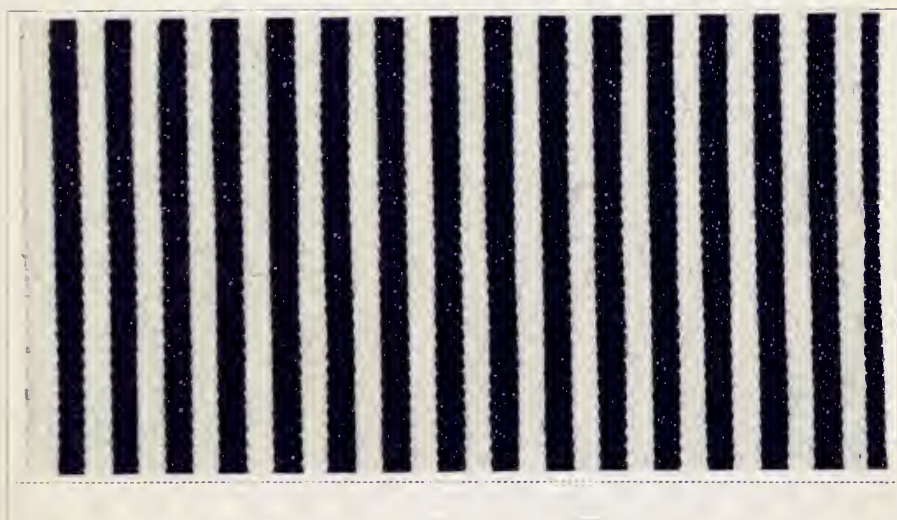
After dyeing, the liquor is immediately removed by means of a pump and the warp freed from excess of liquor by vacuum, this operation being carried out as quickly and effectively as possible. Two warm baths are then given, which are made to circulate for a few minutes, and the rinsing is finally completed with cold water.

FABRICS BLEACHED IN THE PIECE.

75



76



FABRICS COMPOSED OF DYED AND BLEACHED YARN.

The dyebaths for the Blues shown in Nos. 77 and 78 are charged per 90 lbs unbleached cotton yarn and approx. 180 gallons liquor in the vat as follows (see also page 3):

For No. 77.

	Starting bath:	Additions for subsequent lots:
Hydron Blue G pat. Paste 20%	8 lbs	5½ lbs
Hydron Blue R pat. Paste 20%	4 „	3 „
Hydrosulphite conc. Powder	6 „	4 „
Caustic soda lye 77° Tw.	6 „	3 „

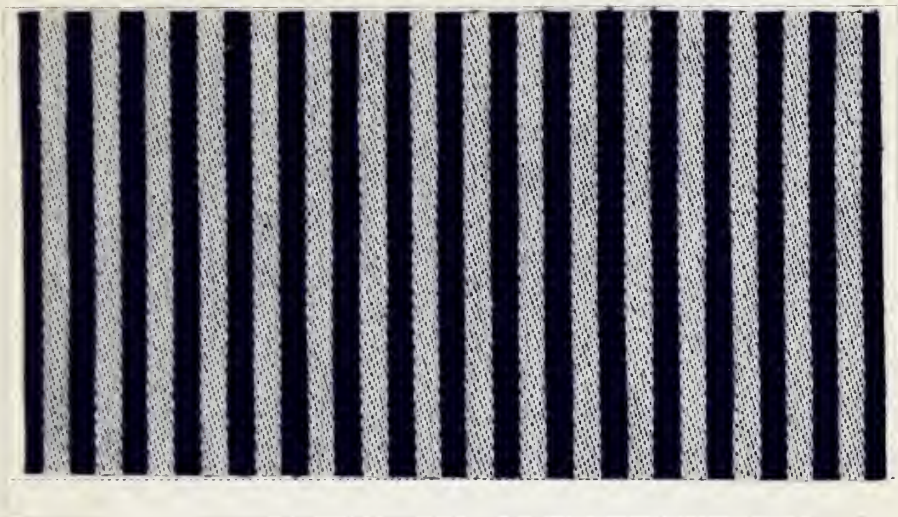
For No. 78.

	Starting bath:	Additions for subsequent lots:
Hydron Blue G pat. Paste 20%	5 lbs	4 lbs
Hydron Blue R pat. Paste 20%	5 „	4 „
Hydrosulphite conc. Powder	6 „	4 „
Caustic soda lye 77° Tw.	6 „	3 „

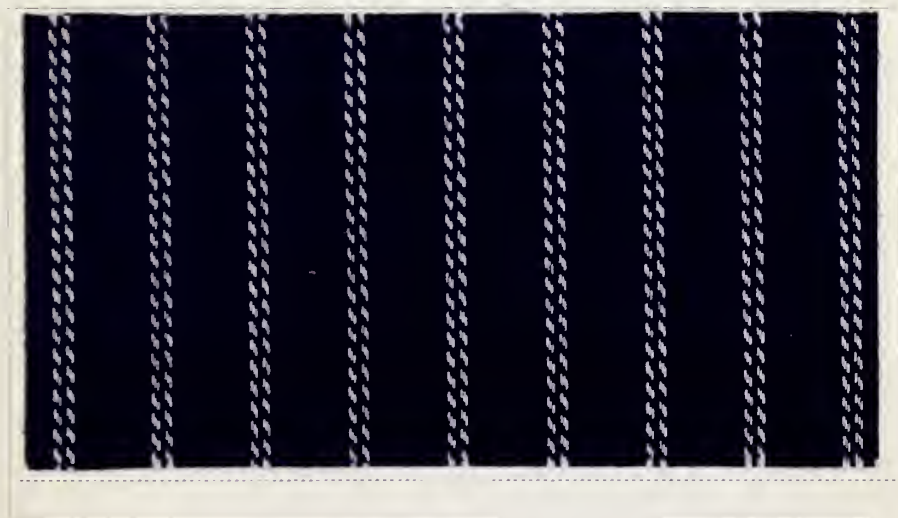
Add the lye and the dyestuff to the bath at about 60° C. (140° F.), and gradually stir in the Hydrosulphite previously dissolved in cold water. Allow the bath to stand for about 5 minutes until the liquor has a yellowish-orange appearance, then enter the yarn, previously boiled in the customary manner, and dye for about ½ hour on bent iron rods.

Hereafter lift the yarn stick by stick, after giving each stickful a few turns in the liquor, squeeze off, and wring off at the wringing post. Then hang in the air for about half-an-hour, and finally rinse, once hot, and then cold.

77



78



CLOTH FOR APRONS COMPOSED OF DYED AND BLEACHED YARN.

The dyebaths for the Blues shown in Nos. 79 and 80 are charged per 90 lbs unbleached cotton and approx. 180 gallons liquor, in the vessel, as follows (see also page 3):

For Light Blue in No. 79.

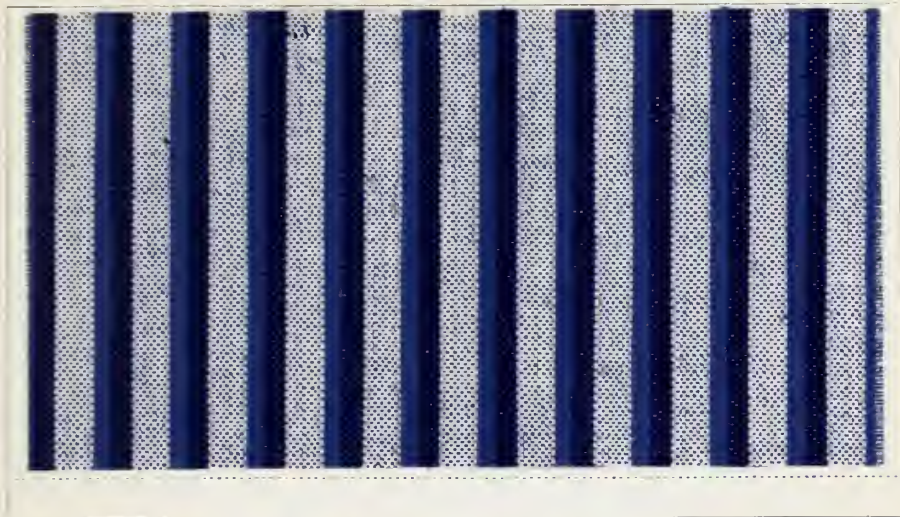
	Starting bath:	Additions for subsequent lots:
Hydron Blue G pat Paste 20%	3 lbs	2 lbs 9 oz
Hydrosulphite conc. Powder	4 "	2 "
Caustic soda lye 77° Tw.	4 "	2 "

For Dark Blue in No. 79 as indicated on page 36 for No. 77.

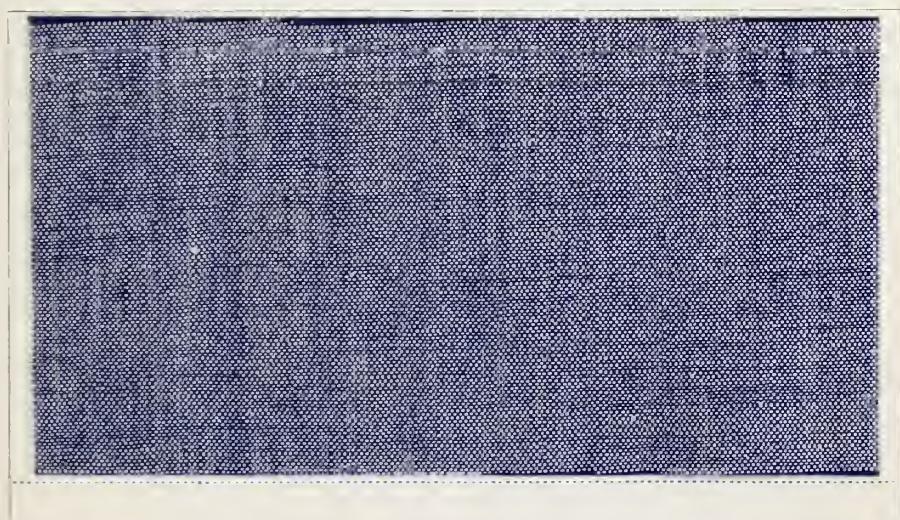
For No. 80.

	Starting bath:	Additions for subsequent lots:
Hydron Blue G pat Paste 20%	5 lbs 9 oz	5 lbs
Hydrosulphite conc. Powder	3 "	2½ "
Caustic soda lye 77° Tw.	3 "	2½ "

79



80



DRESS GOODS COMPOSED OF DYED AND BLEACHED YARN.

The Blues contained in Nos. 81 and 82 are dyed with Hydron Blue R on unbleached cotton yarn.

For dyeing the warp of No. 81 in cheeses by the packing system, the baths are charged as follows (see also page 7):

For 170 lbs Cheeses in approx. 180 gallons liquor:

	Starting bath:	Additions for subsequent lots:
Hydron Blue R pat. Paste 20%	20 lbs	13 lbs
Hydrosulphite conc. Powder	10 „	6½ „
Caustic soda lye 77° Tw.	10 „	5 „

Dye as indicated on page 7.

For the weft of No. 82 dyed on cops in an apparatus, the baths are charged as follows (see also page 7):

For 90 lbs Cops in approx. 120 gallons liquor:

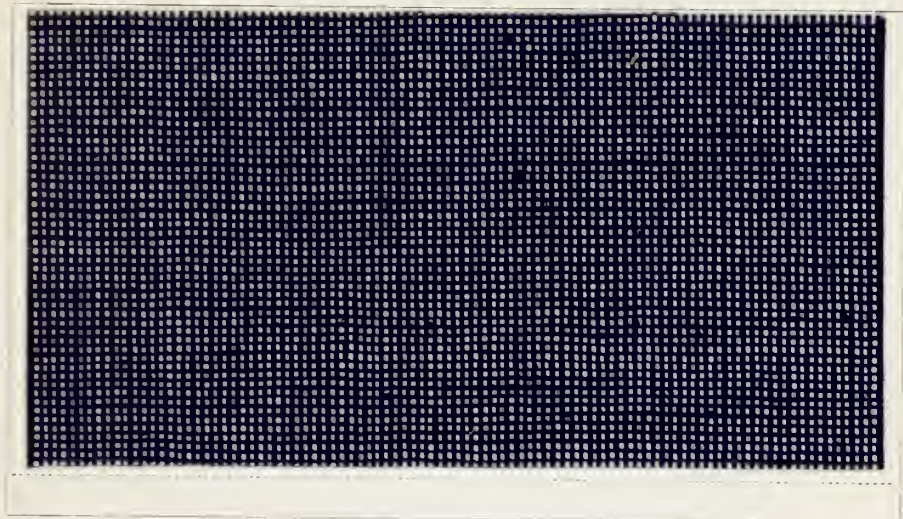
	Starting bath:	Additions for subsequent lots:
Hydron Blue R pat. Paste 20%	18 lbs	12 lbs
Hydrosulphite conc. Powder	9 „	6 „
Caustic soda lye 77° Tw.	9 „	4 „

Before dyeing, wet the cops for about $\frac{1}{4}$ hour in boiling hot condensed water, to which about 4 lbs Monosolvöl are added. Hereafter rinse with cold water.

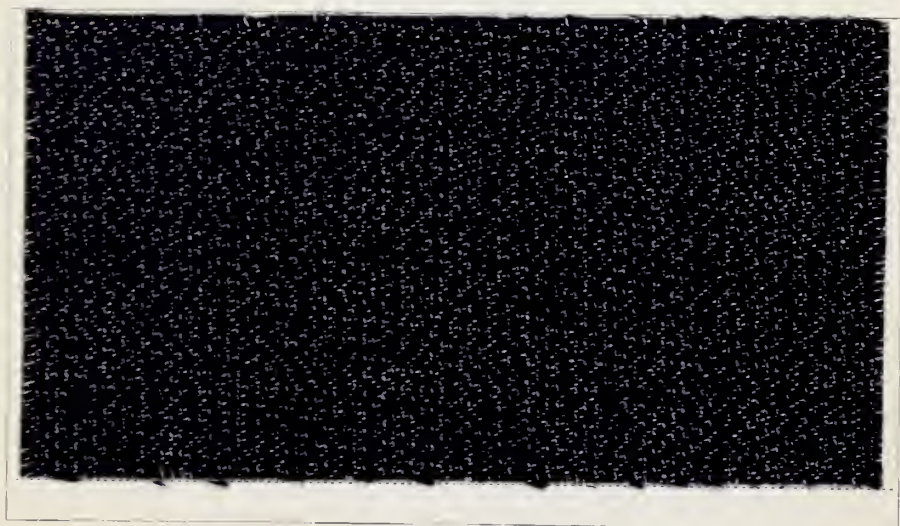
Then dye for about $\frac{1}{2}$ hour in a bath of about 60° C. (140° F.), to which the caustic soda lye, dyestuff and Hydrosulphite have been previously added, as indicated on page 7.

After the dyeing is completed, the receptacle containing the goods is lifted and the liquor removed as thoroughly as possible by means of a vacuum. Hereafter the goods are rinsed in a bath of 50—60° C. (120—140° F.), the rinsing being then completed in cold water.

81



82



HYDRON BLUE PRINTED ON COTTON CLOTH.

No. 83. Hydon Blue G pat. Paste 20%, 12½ oz per gallon of print colour.

No. 84. Hydon Blue R pat. Paste 20%, 12½ oz per gallon of print colour.

For directions for printing Hydon Blue see page 18.

83



84



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